

(PCT Article 36 and Rule 70)

Date of submission of the demand	Date of completion of this report
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## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/EP2004/011490

## Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
- ☐ publication of the international application (Rule 12.4)
- ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1-10 as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the claims:
- nos. 4 (in part), 5-9, 13 (in part), 14-21 as originally filed/furnished
- nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- nos.\* 1-3, 4 (in part), 10-12, 13 (in part) received by this Authority on 09.06.2005 with letter of 24.05.2005
- nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the drawings:
- sheets 1/1 as originally filed/furnished
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

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Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
<b>1. Statement</b>			
Novelty (N)	Claims	<u>1-21</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-21</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-21</u>	YES
	Claims		NO
<b>2. Citations and explanations (Rule 70.7)</b>			
<p>1. Document EP-A2-1.010.945 (D1), which is considered the closest prior art, discloses a method for the combustion of fuel in the combustion chamber (12) of a gas turbine.</p> <p>In that method, fuel and combustion air are mixed prior to entry into the combustion chamber (12), avoiding self-ignition (see D1, column 3, lines 8-11).</p> <p>Furthermore, an enclosed vortex is generated in one or more cavities (40, 42) (see D1, § 9), thereby producing a circulation flow (see D1, figure 1), into which additional fuel is added (see D1, § 11). In addition, as the mixture is ignited in each cavity (see D1, column 5, lines 10 to 12), heating to ignition conditions is guaranteed.</p> <p>The mixture from the pre-mixing stage (20) is introduced into the combustion chamber such that it mixes with a hot combustion gas flowing from the circulation flow, is heated and is combusted</p>			

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	<p>until it exits from the combustion chamber (12) (see D1, column 5, lines 20 to 23).</p> <p>Since there is sufficient interaction between the two mixtures (the main mixture from the pre-mixing stage and the circulation mixture from the cavity) to allow joint ignition and stabilisation (see US-A1-5.619.855, column 5, lines 49-52, and D1, column 2, lines 18-27), it is unavoidable that parts of each of the two mixtures become incorporated into the other mixture flow.</p> <p>It is therefore implicitly disclosed that a first part of the main mixture is introduced into the combustion chamber (12) such that it circulates in the vortex flow.</p> <p>This division of the main mixture is also illustrated in figure 1, in which arrows are used to represent the main mixture, a further arrow shows the flow into the combustion chamber (symbolises the so-called first part of the mixture) and a further arrow is directed into the cavity (symbolises the so-called second part of the mixture).</p> <p>2. The subject matter of claim 1 differs from that known method in that the second part of the mixture is injected substantially perpendicularly to the flow direction of the flowing hot combustion gas from the circulation flow, mixes therewith, is heated and is combusted until it</p>

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	<p>exits from the combustion chamber.</p> <p>3. The subject matter of claim 1 is thus novel (PCT Article 33(2)).</p> <p>4. The current invention can be considered to address the problem of allowing the combustion gas flowing from the circulation flow to thoroughly mix with the first part of the mixture.</p> <p>5. The features of the claim are neither disclosed nor suggested by the prior art.</p> <p>6. The solution to the problem as proposed in claim 1 of the present application therefore involves an inventive step (PCT Article 33(3)).</p> <p>7. In view of the above argument, the subject matter of independent claim 12 is also novel and inventive.</p> <p>8. Claims 2-11 and 13-21 are dependent on claims 1 and 12 and therefore likewise meet the PCT requirements for novelty and inventive step.</p>